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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/833,084	04/10/2001	Ibrahim Abdulhalim	11547 M-10703 US	8866
36257	7590	12/08/2004	EXAMINER	
PARSONS HSUE & DE RUNTZ LLP 655 MONTGOMERY STREET SUITE 1800 SAN FRANCISCO, CA 94111			SMITH, ZANDRA V	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 12/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/833,084	Applicant(s) ABDULHALIM ET AL.	
	Examiner Zandra V. Smith	Art Unit 2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 September 2004.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 21-41, 44-52 and 55-87 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-25, 27-30, 33-36, 44-47, 49-52, 55, 56, 60, 65-68, 71, 72, 74-77 and 81-87 is/are rejected.
- 7) ☒ Claim(s) 26, 27, 31, 32, 37-41, 48, 57, 58, 61-64, 69, 70, 73 and 78-80 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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## DETAILED ACTION

### *Claim Objections*

Claim 79 is objected to because of the following informalities: there is no antecedent for “additional sites”. Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 21-25, 28-30, 55-56, 60, 66, 68, 71-72, 74-77, and 81-87 are rejected under 35 U.S.C. 102(e) as being anticipated by *Sezginer et al. (US 6,819,426)*.

As to **claims 21 and 28**, Sezginer discloses a system for overlay alignment metrology using diffraction gratings, comprising:

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illuminating with electromagnetic radiation (col. 10, line 63) a workpiece having at least two features (10 and 20), one overlaying the other (col. 10, lines 5-10):

detecting spectrally resolved characteristics of the radiation diffracted from the workpiece (col. 10, lines 15-20);

analyzing the characteristics to determine mis-alignment between the layers (col. 10, lines 220-28);

instrumentation for providing a derived signal (col. 16, lines 10-35) and apparatus for determining structural characterization of overlay (col. 10, line 63-col. 11, line 5).

As to **claims 22-23, and 71**, Sezginer discloses everything claimed, as applied above, in addition the determining includes comparing the output signal to a reference signal from a database (col. 16, lines 8-35).

As to **claim 24**, Sezginer discloses everything claimed, as applied above, in addition ellipsometric parameters are determined (col. 7, lines 5-6).

As to **claim 25**, Sezginer discloses everything claimed, as applied above, in addition the gratings have different line widths (col. 9, lines 3-5), the incident radiation is incident at an oblique angle and the diffracted radiation includes zero-order diffraction (see fig. 4).

As to **claims 29-30**, Sezginer discloses everything claimed, as applied above, in addition the differential intensity is derived (col. 10, lines 30-38).

As to **claims 55-56, 60, 68, 74-75, 82, and 84-87** Sezginer discloses a system for overlay alignment metrology using diffraction gratings, comprising:

providing a measurement site including two regions one overlaying the other (col. 10, lines 5-10 and col. 10, line 63) having the same periodicity (10 and 20);

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illuminating a semiconductor wafer with electromagnetic radiation (col. 10, line 63); and analyzing the characteristics to determine lateral shift between the layers (col. 10, lines 220-28) as a function of wavelength (col. 10, lines 15-20);

instrumentation for providing a derived signal (col. 16, lines 10-35) and apparatus for determining structural characterization of overlay (col. 10, line 63-col. 11, line 5).

As to **claim 66**, Sezginer discloses everything claimed, as applied above, in addition the structures are tow-dimensional (see fig. 5).

As to **claim 72**, Sezginer discloses everything claimed, as applied above, in addition the information includes thickness and critical dimension (col. 7, lines 30-35).

As to **claim 77**, Sezginer discloses everything claimed, as applied above, in addition the optics measure the parameters as a function of wavelength (col. 7, lines 5-10).

As to **claims 81 and 83**, Sezginer discloses everything claimed, as applied above, in addition the structures are two-dimensional and connected to the same substrate (see fig. 5).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 33-36, 44-45, 47, 49, and 50-52, are rejected under 35 U.S.C. 103(a) as being unpatentable over *Sezginer et al. (US 6,819,426 B2)* in view of *Nikoonahad et al. (US 6,710,876 B1)*.

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As to **claims 33, 36, 44, 47, and 51-52**, Sezginer discloses a system for overlay alignment metrology using diffraction gratings, comprising:

a source illuminating with electromagnetic radiation (col. 10, line 63) a workpiece having at least two features (10 and 20), one overlaying the other (col. 10, lines 5-10):

a detector detecting spectrally resolved characteristics of the radiation diffracted from the workpiece (col. 10, lines 15-20);

a signal processor analyzing the characteristics to determine mis-alignment between the layers (col. 10, lines 220-28). Additionally, Sezginer provides determination of ellipsometric parameters (col. 7, lines 5-6) using polarization, although an analyzer and polarizer are not specifically provided, it is well known that polarization components, specifically a polarizer and analyzer, are necessary to determine ellipsometric parameters. Nikoonahad provides an analyzer (118, col. 7, line 32). It would have been obvious to one having ordinary skill in the art at the time of invention to include an analyzer to permit passage of light to the detector along a particular plane necessary to determine the ellipsometric parameters. As to the use of a rotating polarizer this would have been obvious as a means to provide the incident light the proper polarization.

As to **claims 34 and 45**, Sezginer discloses everything claimed, as applied above, in addition the gratings have different line widths (col. 9, lines 3-5), the incident radiation is incident at an oblique angle and the diffracted radiation includes zero-order diffraction (see fig. 4).

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As to **claims 49-50**, Sezginer discloses everything claimed, as applied above, in addition instrumentation for providing a derived signal (col. 16, lines 10-35) and apparatus for determining structural characterization of overlay (col. 10, line 63-col. 11, line 5)

Claims 65 and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Sezginer et al. (US 6,819,426 B2)*.

As to **claims 65 and 67**, Sezginer discloses everything claimed, as applied above, with the exception of illumination with different polarization states, however since ellipsometric parameters are determined (col. 7, lines 5-6) and since it is well known that the determination of ellipsometric parameters involves the use of polarization components, it would have been obvious to one having ordinary skill in the art at the time of invention to one having ordinary skill in the art to include illuminating with polarized light of different states of polarizations to illuminate the structures with light necessary to derive the ellipsometric parameters.

#### ***Allowable Subject Matter***

Claims 26-27, 31-32, 37-41, 57-59, 61-64, 69-70, 73, and 78-80 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record, taken alone or in combination, fails to disclose or render obvious normal illumination with zero order diffraction detected (claims 26, 46 ), normal illumination with detection of positive and negative first order diffraction (claims 27), providing a neutral polarization angle (claim 31), a first analyzer to collect first-order diffraction and a second analyzer to detect negative first-order diffraction (claims 37, 48), additional site with two regions

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(claims 57-59), measurement at different angles (claims 61, 69), or measurement as a function of change in polarization amplitude (78), in combination with the rest of the limitations of the claims.

***Response to Arguments***

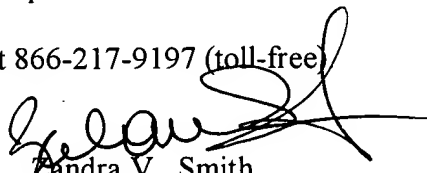
Applicant's arguments with respect to all pending claims have been considered but are moot in view of the new ground(s) of rejection.

***Fax/Telephone Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zandra V. Smith whose telephone number is (571) 272-2429. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Zandra V. Smith  
Primary Examiner  
Art Unit 2877